



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/996,695	11/30/2001	Otto Z. Zhou	032566-018	1828

7590

12/01/2003

Ronald L. Grudziecki
BURNS, DOANE, SWECKER & MATHIS, L.L.P.
P.O. Box 1404
Alexandria, VA 22313-1404

EXAMINER

MAYEKAR, KISHOR

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 12/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/996,695

Applicant(s)

ZHOU ET AL.

Examiner

Kishor Mayekar

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 September 2003 and 25 September 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-73 is/are pending in the application.
- 4a) Of the above claim(s) 30-41 and 48-65 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29, 42-47 and 66-73 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of invention of group I, claims 1-29 in Paper No. 6 is acknowledged. The traversal is on the ground(s) that "a thorough search for the subject matter of any one group would necessarily encompass a search ~~a-search~~ for the subject matter of the remaining groups". This is not found persuasive because the record reflects that all of these groups are patentably distinct and have been properly considered.

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

2. Claims 3 and 20 are objected to because of the missing --and-- before the phrase "oxygen" in claim 3 and the typo error "B" in claim 20. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 3 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the materials of the nanotubes composed of either single or multiple elements, does not reasonably provide enablement for the materials of the nanotubes comprised single elements of boron, nitrogen or oxygen. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

5. Claims 42-47 and 66-73 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for

1) the step of attaching a single nanotube, nanotube bundle or nanowire onto a sharp tip of a sharp object, does not reasonably provide enablement for

the same while depositing the nanostructure-containing material onto the immersed electrode substrate with a direct or alternating current; and

2) for the step depositing a pattern of nanostructure-containing material onto the substrate, does not reasonably provide enablement for the same while depositing the nanostructure-containing material onto the same immersed electrode substrate with a direct or alternating current.

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1, 7, 8, 17 and 24 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the phrase "whereby" is indefinite for the action following the phrase does not necessarily occur.

Regarding claim 7, the claim is a redundant of claim 6 when the material is single-walled carbon nanotubes.

Regarding claim 8, the phrase "the single-walled carbon nanotubes" lacks antecedent basis.

Regarding claim 17, the same is applied to claim 8. And the phrase "liquid medium" is confusing as whether it is the same liquid medium of claim 1 or another.

Regarding claim 24, the phrase "nanostructures" is confusing as whether it is the nanostructure-containing material of claim 1 or another.

Claim Rejections - 35 USC § 102 or 103

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-8, 12, 13, 16, 18 and 22-24 are rejected under 35 U.S.C. 102(a) as being anticipated by AFFOUNE et al. ("Electrophoretic Deposition of Nanosized Diamond Particles", Langmuir 2001, 17, 547-551). The reference's invention is directed to an electrophoretic deposition of diamond particles. The reference

discloses in the abstract and experimental procedure that the electrophoretic deposition comprises all the steps as claimed.

11. Claims 9-11, 14, 17, 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over AFFOUNE et al. The reference as applied above further contemplates the electrophoretic deposition study of diamond nanoparticles works for the nanometer size particles as well (under Results and Discussion, first paragraph on page 548 and second paragraph on page 549, and paragraph crossing on page 550). The differences between the reference as applied above and the instant claims are each of the subject matter recited.

As to the subject matter of claims 9-11, the selection of any of known equivalent nanoparticle material would be within the level of ordinary skill in the art. The same is applied to claim 17.

As to the subject matter of claims 14 and 15, the reference discloses the use AlCl_3 in water to generate a positive surface charge of diamond particles (second paragraph of the right column of page 547). As such the selection of concentration and any of known equivalent charger would be within the level of ordinary skill in the art.

As to the subject matter of each of claims 19-21, the selection of the subject matter would also be within the level of ordinary skill in the art.

12. Claims 1-8, 12, 13, 16, 22, 24, 28 and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by GAL-OR et al. (6,258,237). GAL-OR's invention is directed to a method of electrophoretically depositing diamond particles on a surface of a substrate. GAL-OR discloses in the Examples that the method comprises all the steps as claimed and in col. 10, lines 61-62 that small particles of diamond of 10-500nm are used.

13. Claims 15 and 19-21 are rejected under 35 U.S.C. 103(a) as being obvious over GAL-OR '237. The differences between GAL-OR and the instant claims are each of the subject matter in the instant claims. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified GAL-OR's teachings because the selection of the subject matter such as concentration and electrical field would be within the level of ordinary skill in the art.

14. Claims 1-5, 12-24 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over BOJKOV et al. (5,906,721). The reference's invention is directed to a method for preparing phosphor films that exhibit decreased coulombic aging. The reference discloses that the method comprises all the steps as claimed where the phosphors are in powder form with particle size ranging from 1 to 20 microns, or smaller (see Fig. 1A; col. 4, line 26-34; col. 4, line 52 through col. 5, line 27; col. 5, line 66 through col. 6, line 27; col. 6, line 50-56; and Examples 1 and 2). The difference between the reference and the above claims is whether the small phosphor particles are in the nano range. Since the reference discloses that phosphor particle in the range of less than 1 micron can be used, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the reference's teachings because the range of particle sizes of less than 1 micron is of nano range.

15. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over AFFOUNE et al., GAL-OR '237 or BOJKOV '721 as applied to claims 1 and 24 above, and further in view of DE JAEGER et al. (5,296,117). The difference between each

Art Unit: 1753

of the references applied above and the instant claims is the provision of a binder material. DE JAEGER shows in a method of electrophoretically depositing phosphor particles the use of binder in addition to a charger (paragraph crossing cols. 10 and 11). The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified each of the reference's teachings because the use is conventional and this result in fixing the electrophoretically deposited particles.

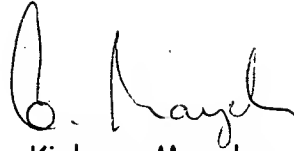
16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kishor Mayekar whose telephone number is (703) 308-0477. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Application/Control Number: 09/996,695
Art Unit: 1753

Page 11

A handwritten signature in black ink, appearing to read 'K. Mayekar', written in a cursive style.

Kishor Mayekar
Primary Examiner
Art Unit 1753

KM